



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,106	09/13/2005	Josef Bock	1435.121.101/12307US	6366
25281	7590	03/16/2006	EXAMINER	
DICKE, BILLIG & CZAJA, P.L.L.C. FIFTH STREET TOWERS 100 SOUTH FIFTH STREET, SUITE 2250 MINNEAPOLIS, MN 55402			CRANE, SARA W	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 03/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/521,106

Applicant(s)

BOCK ET AL.

Examiner

Sara W. Crane

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 9-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-11, 16, 17-19, 23, 24, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higuchi.

With respect to claims 9, Higuchi teaches in figure 1 emitter 11, contacted by emitter electrode 11, base 2, contacted by base electrode 10, and collector 1, contacted by collector electrode 9. Electrode 11 is polysilicon (column 4, lines 58-59) doped with phosphorus (column 4, line 66). Phosphorus causes a high density of vacancies in polysilicon (an inherent property, as noted by Applicant's specification, page 4 lines 22-23). Note that a newly-discovered property of a previously known structure cannot serve to distinguish. The claim is anticipated, hence obvious. With respect to claim 10, the reference teaches P. With respect to claim 11, the range recited would have been obvious because it falls within the range taught by the reference (column 5, lines 5-8). With respect to claim 16, the designation of "self-aligned" appears to refer to a process of making, which has not been shown to give rise to structure distinct to that of the reference. The other claims rejected above have limitations that parallel those of claims 9-11 and 16, and would have been taught or obvious for the same reasons.

Claims 9-13, 15-21, 23-26, and 28-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higuchi in view of Kalnitsky et al.

With respect to claim 9, the regions of the Higuchi device are identified as above. Layer 10 is a base electrode which is polysilicon (column 4, line 58). Kalnitsky et al. teaches to insert carbon into a boron-doped polysilicon base electrode (column 3, lines 14-28). It would have been obvious to insert carbon into the base electrode of the Higuchi device for the reasons noted by Kalnitsky et al. A high density of vacancies would be inherent in the ion implant process, which causes vacancies due to the high energy of the ion beam. With respect to claim 10, C is taught by Kalnitsky et al. With respect to claim 11, Kalnitsky et al. teaches the desired final C concentration is about 1% (column 5, line 5). The atomic density of silicon is about  $5 \times 10^{22}$  atoms/cm<sup>3</sup>, so 1% of this would be about  $5 \times 10^{20}$  atoms/cm<sup>3</sup>, which falls within the range of the claim. With respect to claim 12, the base electrode of Higuchi is doped with boron. With respect to claim 13, the doping recited is within the range taught by Higuchi at column 3, lines 1-2. Other claims not specifically discussed contain limitations which parallel those discussed above, and would have been taught or obvious for the same reasons.

Claims 14, 22, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higuchi in view of Kalnitsky et al., and further in view of Oda et al.

Oda et al. teaches to make an electrode of polycrystalline silicon-germanium (column 1, lines 43-45). It would have been obvious to make the polysilicon layers of

Art Unit: 2811


the Higuchi device of this material, to obtain the known and desirable conductivity properties of silicon-germanium.

Prior art made of record and not relied upon is considered relevant. Geiss et al. is a teaching similar to Kalnitsky et al. Ishgaki et al. teaches dopant densities in the various regions of a bipolar transistor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Crane, whose telephone number is (571) 272-1652.

The supervisor for Art Unit 2811, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sara W. Crane  
Primary Examiner  
Art Unit 2811